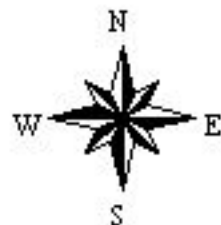


# LEGEND

Powhatan Creek Watershed	Proposed RPA Extension	Proposed Conservation Areas	Low Density Residential
Subwatershed Boundary	Priority Regional Stormwater Management Sites	Conservation Area ID	Medium Density Residential
Rpa	Priority Retrofit Sites	Bald Eagle Nest	High Density Residential
Rpa buffer	Potential Retrofit Sites ID	Blue Heron Colony	Mixed Use
Hydrology	Catchment Boundaries	RTE Plants	Limited Industry/Business
Roads	Catchment Boundaries ID	Historical Points of Interest	Rural
	Potential Stream Rehabilitation Area		

## Powhatan Creek Watershed Subwatershed 210

900 0 900 1800 Feet





## Subwatershed No. 210

### OVERALL PROGNOSIS:

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**This IMPACTED subwatershed has seen rapid growth in just the last two years, and has a current impervious cover of nearly 19%. If current zoning is built out, impervious cover is expected to climb to 24%. Stream habitat scores are in the Fair/Good range, but the uppermost reaches have recently experienced extensive degradation and incision. Contiguous forests or RTE species are absent. Some high quality wetlands exist in floodplain areas, but not all of these are fully protected by the RPA. This subwatershed is a candidate for watershed restoration and targeted watershed education efforts.**

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**See Figure**

**Drainage Area:** 1.12 sq. miles (716.8 acres)

### Land Use in Subwatershed 210

	<i>Percentage</i>	<i>Subwatershed Category</i>
2000 Impervious Cover	18.6 %	Impacted
Future impervious cover (with buildout)	24.7 %	Impacted
<i>Target Watershed Classification</i>		<b>Impacted</b>

*Developable area in subwatershed:* 134.9 acres or 19% of subwatershed area

### Conservation Areas in 210

Low potential for RTE species.

*Contiguous forest areas:* No.

*Wetland areas:* Several high quality floodplain wetlands are present in the subwatershed; but are not fully protected by the RPA.

*Beaver dam complexes:* Little activity until the confluence of the stream with the mainstem. At this point, there is extensive beaver activity and inundation.

### *Historic Sites:*

Powhatan Plantation--In 1684 almost 2000 acres were patented to the east and south of Powhatan Creek and Drinking Swamp (a branch of Powhatan Creek). In the 18<sup>th</sup> century, it became the family seat of Richard Taliferro (pronounced "Toliver"), one of Virginia's 100 Richest families in the 1780s.

## Powhatan Creek Watershed Management Report

### Stream Conditions in 210

<b>Table 210-1. General Stream Condition in Subwatershed 210</b>		
<b>Stream Quality</b>	<b>Description</b>	<b>Rank</b>
<i>Good/Fair</i>	<i>Evidence of channel widening, sediment deposition, incision and enlargement; high incidence of floodplain impairment; good candidate for stream restoration</i>	<i>7 of 11</i>

*Habitat Assessment:* Stream assessment scores indicate that the stream is in the Fair to Good category. Several headwater stream reaches were experiencing extensive degradation, and the lower stream reaches were impounded by beaver activity.

### Stormwater Management in 210

Subwatershed 210, divided into 4 catchments, currently has the highest impervious cover in the watershed. Most of the development has incorporated stormwater management practices and only one priority stormwater retrofit area is located in the subwatershed. The limited developable areas should use on-site stormwater management.

<b>Table 210-2. Priority Stormwater Retrofit Areas</b>			
<b>Retrofits</b>	<b>Type of Retrofit and Rank</b>		<b>Benefit</b>
	<b>Regional Ponds for Future Development</b>	<b>Stormwater Retrofit</b>	
<i>210-1</i>	--	<i>9 of 17</i>	Retrofit a the dry pond to provide $Cp_v$ . This retrofit may be implemented in conjunction with stream rehabilitation.

### Recommendations for Subwatershed 210

#### Watershed Education

- Homeowner education on low impact lawn care, pet waste, and other water quality issues.

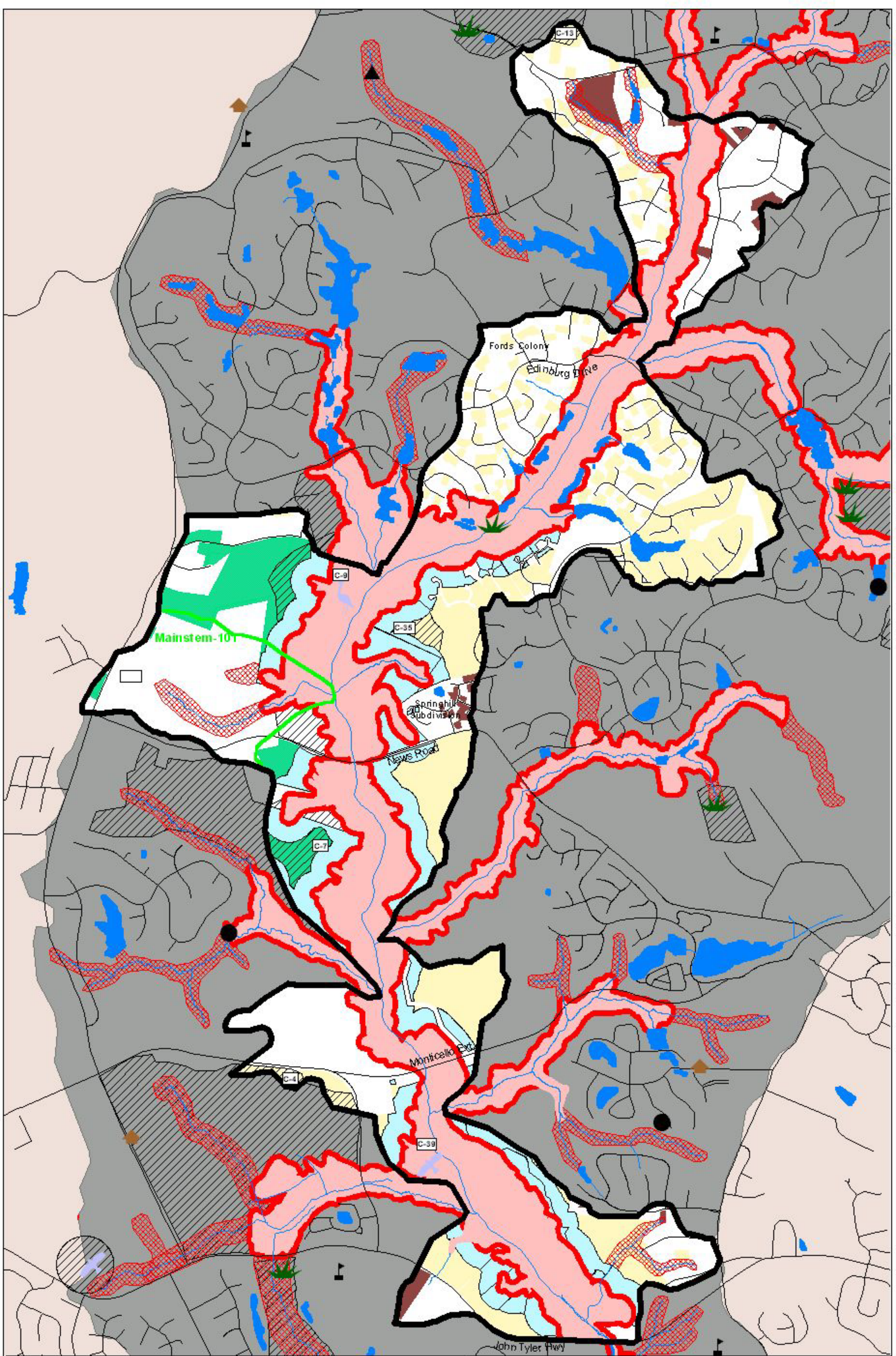
#### Aquatic Buffers

- Concentrate required open space along streams and wetlands or in the mainstem corridor.

#### Restoration

- Good candidate site for stream restoration







## Powhatan Creek Watershed Management Report

### Powhatan Creek Mainstem (Non-tidal)

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#### OVERALL PROGNOSIS

Although hard to reach, the mainstem of Powhatan Creek is truly the jewel of the entire watershed. It contains extensive wetland complexes of outstanding quality, as well as the largest tract of contiguous floodplain forest in the watershed. About a fourth of this segment is influenced by beaver, which creates a diverse mosaic of wetland zones. Species of plants found there include smart weed, yellow coneflowers, sweetbay magnolia, black tupelo, black gum and bald cypress. The free-flowing creek still has good to excellent stream habitat scores, is home to several RTE species, and contains essential habitats for wildlife, waterfowl and wading birds. Currently classified as SENSITIVE, this segment is expected to be adversely influenced by greater stormwater flows and pollutant loadings as the Powhatan Creek watershed (19.5 sq. mile contributing area) continues to develop. Based on current zoning, the impervious cover for non-tidal mainstem area could climb from 4 to 12%.

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#### See Figure

**Segment Area:** 3.43 sq. miles (2197.2 acres)

#### Land Use in Mainstem (non-tidal)

	<i>Percentage</i>	<i>Subwatershed Category</i>
2000 Impervious Cover	3.8 %	Sensitive
Future impervious cover (with buildout)	12.3 %	Impacted
Target Watershed Classification		<b>Sensitive</b>

*Developable area:* 688 acres or 31% of segment area

#### Conservation Areas in the Mainstem (non-tidal)

<i>Table MNT-1. Priority Conservation Areas in the Mainstem (non-tidal)</i>			
<i>Conservation Area</i>	<i>Description</i>	<i>Conservation Area Ranking</i>	<i>Acquisition Ranking</i>
<b>C-34</b>	<i>High quality stream above News Rd.</i>	<i>9 of 21</i>	<i>7 of 17</i>
<b>C-35</b>	<i>Contiguous forest and heron rookery</i>	<i>5 of 21</i>	<i>3 of 17</i>
<b>C-39</b>	<i>Eagles nest</i>	<i>14 of 21</i>	<i>12 of 17</i>

*Presence of RTE species:* Potential for bald eagle. Probable habitat of least trillium. Large blue heron rookery found in upper portion of segment.

*Contiguous forest areas:* The forests surrounding the Powhatan Creek constitute the largest contiguous tract within the watershed.

*Wetland areas:* Much of the segment contains wetlands of exceptional quality and diversity. Wetland types include mature forested wetlands, successional forest wetlands, standing snags, open water wetlands, emergent wetlands, submergent wetlands, mixed wetlands, and extensive floodplain wetlands. These

## Powhatan Creek Watershed Management Report

contiguous wetlands support a diverse biological community including wood ducks, teal, black ducks, pileated woodpeckers and herons.

Five wetland areas within the segment were evaluated for functional value in relation to water quality and wildlife habitat. The average wetland score was 84% out of a possible 100%, which is an exceptionally high score for any non-tidal wetland.

### *Historic Places:*

Powhatan Plantation--In 1684 almost 2000 acres were patented to the east and south of Powhatan Creek and Drinking Swamp (a branch of Powhatan Creek). In the 18<sup>th</sup> century, it became the family seat of Richard Taliferro (pronounced "Toliver"), one of Virginia's 100 Richest families in the 1780s.

### **Stream Conditions in the Mainstem (non-tidal)**

<b><i>Table MNT-2. General Stream Condition in the Mainstem (non-tidal)</i></b>		
<b><i>Stream Quality</i></b>	<b><i>Description</i></b>	<b><i>Rank</i></b>
<i>Excellent</i>	<i>The mainstem contains both high quality stream habitat and high quality wetland habitat.</i>	<i>2 of 11</i>

*Initial habitat assessment:* According to stream assessment scores, the condition of the mainstem creek was generally excellent, with average scores in excess of 165. Both the stream channel and the adjoining floodplain were in good shape, with somewhat higher scores in the upper portion of the mainstem of the creek. As noted above, about a fourth of the mainstem segment is inundated by beaver activity, and could not be assessed by the stream assessment techniques.

In addition, several small first and second order creeks directly drain into the segment, and these are also in good/excellent condition.

### **Stormwater Management in the Mainstem (non-tidal)**

One catchment (Mainstem 101) has been delineated and contains a high quality stream. The catchment is considered a priority for a Stream Protection Area and if further development takes place it should be under the Special Stormwater Criteria.

*Area served by stormwater practices:* 8% of segment area.

*Retrofit candidates:* None at this time.

## Powhatan Creek Watershed Management Report

### **Other Observations on the Mainstem of Powhatan Creek (non-tidal)**

*Fish barriers:* No obvious man-made fish barriers are present in the segment. An analysis of fisheries data suggests that anadromous fish do not extensively spawn in the creek, possibly because of upstream beaver dams (upstream of Route 5 crossing) or the proximity of larger creeks (e.g., Chickahominy). Further sampling during the spring may be needed to establish this fact.

*Beaver dam complexes:* About 1.5 miles of the mainstem of Powhatan Creek is influenced by beaver activity, which constitutes nearly 25% of its total length. Beaver continue to play a strong role in shaping the character and structure of this wetland complex.

*Water quality conditions:* Water quality conditions in this segment have been conducted by Virginia Department of Environmental Quality (VA DEQ) downstream of the bridge at Highway 613. A complete analysis of water quality data will be provided in final baseline report. More detailed longitudinal monitoring is being conducted within this segment, and preliminary results indicate high nutrient levels as well as occasional fecal coliform violations.

*Fisheries:* About 15 fish species have been collected in this segment, including largemouth bass, chain pickerel, bluegills, crappies, pirate perch and American eels.

#### *Historic Places:*

Three Ship Pier--Full size replicas of the ships that brought America's first English colonists to Virginia in 1607 are moored at Jamestown. They are the Susan Constant, the Godspeed, and the Discovery.

Jamestown Settlement--A living history indoor-outdoor museum that tells its story through multi-media presentations. Through these presentations the visitor explores the worlds of the settlers and the Native Americans.

Neck-O-Land--Across Back River from Jamestown Island. Artifacts recently recovered from a residential development site reveal that Neck-O-Land was a prosperous suburb between 1630 and 1650. Consisting of 1200 acres, with Powhatan Creek on the west, it was owned by Reverend Rich Buck in 1619 and inherited by his son Peleg. The neighborhood of Peleg's Point site on part of this tract.

Mainland Farm--Not long after 1607, the colonists realized that better farming opportunities awaited them on the mainland, or "Main." Mainland Farm is the oldest (1618) continuously running farm in America. Reflecting this fact, James City County has raised \$2 million needed to preserve this 217-acre historic treasure.

## Powhatan Creek Watershed Management Report

### **Recommendations for Mainstem Non-Tidal**

#### Land Conservation

- Acquisition or easement of the large contiguous forest mainstem (C-35) above News Rd. containing a blue heron colony and a mature bald cypress stand.
- Acquisition or easement of the tract associated with the high quality stream (C-34)
- Acquisition or easement of the tract surrounding the bald eagle nest with recent activity (C-39).

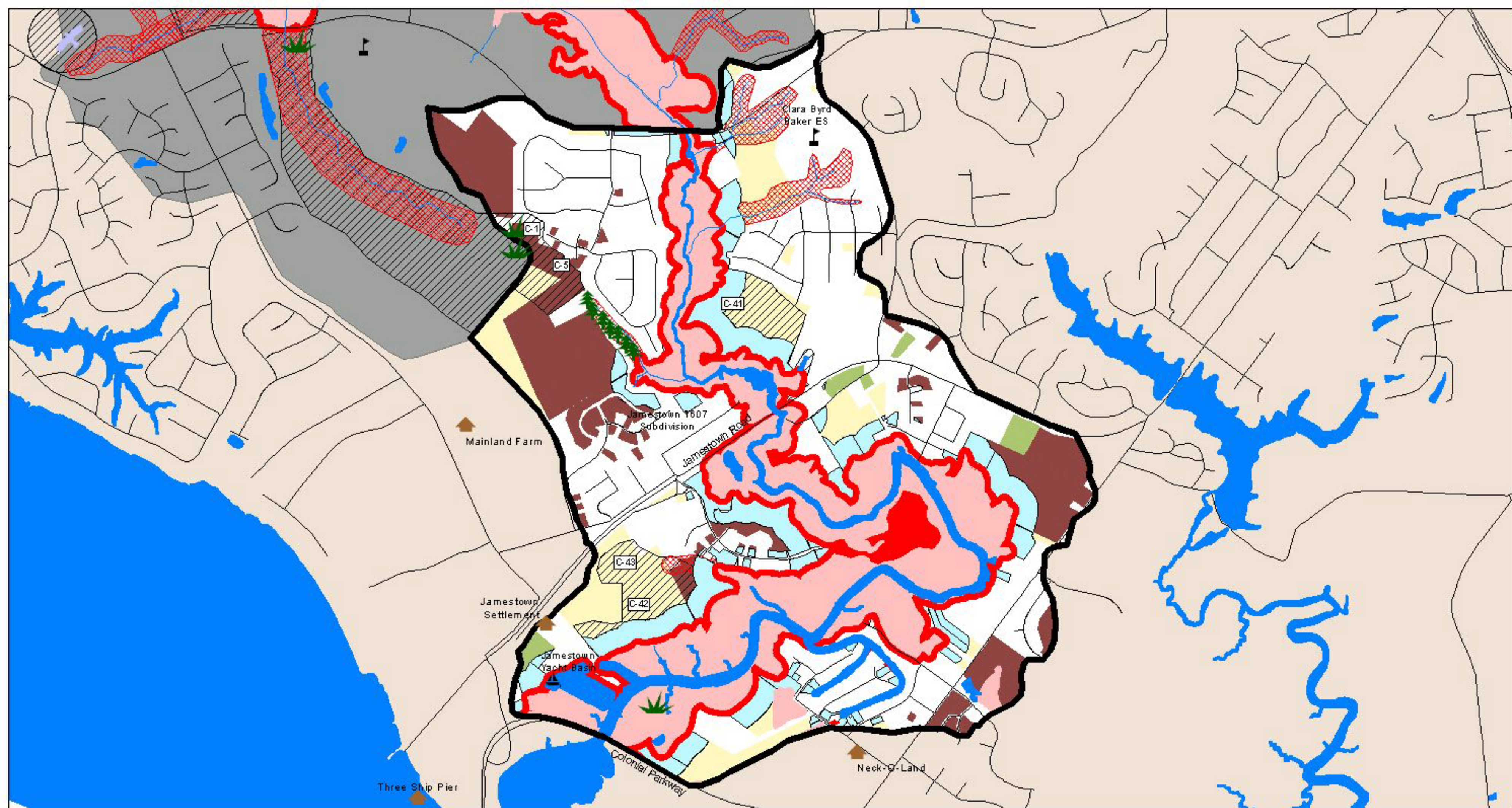
#### Aquatic Buffers

- Increase the width of the buffer associated with the mainstem non-tidal to 300 ft to preserve the contiguous forest and limit the intrusion of invasive species into the high quality mainstem wetlands. This would also serve to limit impervious cover in the this subwatershed.

#### Better Site Design

- Allowances in the zoning to cluster down - maintaining the same density. This would result in the increased preservation of the mainstem contiguous forest without reducing the number of units built by the developer.



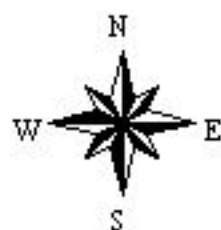


# LEGEND

Powhatan Creek Watershed	Proposed RPA Extension	Proposed Conservation Areas	<b>Undeveloped Land</b>
Subwatershed Boundary	Priority Regional Stormwater Management Sites	Conservation Area ID	Low Density Residential
Rpa	Priority Retrofit Sites	Bald Eagle Nest	Medium Density Residential
Rpa buffer	Potential Retrofit Sites ID	Blue Heron Colony	High Density Residential
Hydrology	Catchment Boundaries	RTE Plants	Mixed Use
Roads	Catchment Boundaries ID	Historical Points of Interest	Limited Industry/Business
Proposed 300ft Buffer	Potential Stream Rehabilitation Area		Rural

## Powhatan Creek Watershed Tidal Mainstem

1500 0 1500 3000 Feet





## Tidal Mainstem

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### OVERALL PROGNOSIS:

Based on the amount of impervious cover present, the tidal creek section can be classified as **IMPACTED**; however, given the importance of this estuarine habitat, special protection is warranted. The tidal mainstem is designated a Resource Protection Subwatershed. This scenic segment contains high quality tidal wetlands dominated by softstem bulrush, rice cut grass, pickerel weed, narrow leaved cattail, arrow arum and bald cypress. Twenty-two percent of this segment is protected by RPA. Several RTE species are found in the segment, including bald eagles, and the area is notable for waterfowl habitat. Water quality is generally good, except for violations of the fecal coliform standard, which prevents shell-fishing in portions of the tidal creek. Waterfront developments are intense in this segment and may ultimately increase impervious cover to 16% within the segment. This type of development also has resulted in significant alterations in the shoreline margins and forest cover. Stormwater pollutant loads from the increased waterfront development and from drainage of the entire 22 square mile watershed are likely to increase fecal coliform problems for this 303(d) listed water body.

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See Figure

**Segment Area:** 2.5 sq. miles (1602 acres)

#### Land Use in the Mainstem (tidal)

	<i>Percentage</i>	<i>Subwatershed Category</i>
2000 Impervious Cover	13.6 %	Impacted
Future impervious cover (with buildout)	16.4 %	Impacted
Target Watershed Classification		<b>Impacted</b>

*Developable area:* 688 acres or 31% of segment area

#### Priority Conservation Areas in the Mainstem (tidal)

<i>Table MT-1. Priority Conservation Areas in the Mainstem (tidal)</i>			
<i>Conservation Area</i>	<i>Description</i>	<i>Conservation Area Ranking</i>	<i>Acquisition Ranking</i>
<b>C-41</b>	<i>Contiguous forest mid-tidal</i>	<i>12 of 21</i>	<i>10 of 17</i>
<b>C-42/C-43</b>	<i>Contiguous forest in the lower tidal</i>	<i>13 of 21</i>	<i>11 of 17</i>

*Presence of RTE species:* Both the tidal wetlands and non-tidal wetlands in this segment harbor a number of RTE species. Parkers pipewort is found in the tidal wetlands, and false hopsedge and sweet pinesap have been reported in the non-tidal wetlands. Bald eagles are routinely sited in this area, although there are no recent reports of nesting activity. The tidal wetlands are an important nursery and feeding area for fish, wading birds, ducks and osprey.



## Powhatan Creek Watershed Management Report

*Contiguous Forest Areas:* Small tracts of contiguous forest exist, however, extensive stands of cypress, tupelo and other trees provide valuable habitat structure adjacent to the tidal wetlands.

*Dominant Wetland Areas:* Tidal wetlands dominate the segment, and include softstem bulrush, rice cut grass, pickerelweed, narrow leaf cattail, and arrow arum.

### *Historic Sites:*

Three Ship Pier—Full size replicas of the ships that brought America's first English colonists to Virginia in 1607 are moored at Jamestown. They are the Susan Constant, the Godspeed, and the Discovery.

Jamestown Settlement—A living history indoor-outdoor museum that tells its story through multi-media presentations. Through these presentations the visitor explores the worlds of the settlers and the Native Americans.

Neck-O-Land—Across Back River from Jamestown Island. Artifacts recently recovered from a residential development site reveal that Neck-O-Land was a prosperous suburb between 1630 and 1650. Consisting of 1200 acres, with Powhatan Creek on the west, it was owned by Reverend Rich Buck in 1619 and inherited by his son Peleg. The neighborhood of Peleg's Point site on part of this tract.

### **Stream Conditions in the Mainstem (tidal)**

<b>Table MT-2. General Stream Condition in the Mainstem (tidal)</b>		
<b><i>Stream Quality</i></b>	<b><i>Description</i></b>	<b><i>Rank</i></b>
<i>N/A - Tidal</i>	<i>Important fishery and the presence of closed shellfish beds</i>	<i>N/A</i>

### **Stormwater Management in the Mainstem (tidal)**

Special design criteria for the tidal mainstem are suggested to help address the fecal coliform problem and to reduce local erosion from outfalls.

More detail is provided in the Stormwater Master Plan for the Powhatan Creek Watershed.

### **General Condition of Tidal Creek**

*Wetland Habitat:* The stream assessment method used is not appropriate for evaluating the quality and function of the tidal wetlands. A functional wetland assessment was conducted within the tidal wetland, and it was rated as having good functional value for wildlife habitat, and good functional value for water quality. The functional value of the wetland was reduced by shoreline alteration at numerous points along the tidal creek.

*Water Quality Conditions:* Water quality conditions in this segment are routinely monitored By VA DEQ at the bridge over the Colonial National Historical parkway. A complete analysis of water quality data is provided in baseline report. Based on violations of fecal coliform standards, this segment has been listed

## Powhatan Creek Watershed Management Report

as impaired by the State, and a TMDL is being prepared. More detailed longitudinal monitoring is being conducted within this segment.

*Fisheries:* The State has periodically collected fishery data at Jamestown Road. Thirty-four fish species have been reported in this segment, according to Virginia Department of Game and Inland Fisheries (DGIF) records.

### **Other Observations on the Tidal Segment of Powhatan Creek**

The shoreline of the tidal creek has been bulkheaded or rip-rapped in about twenty locations.

Shell-fishing is prohibited at several points along the tidal creek due to occasional violations of fecal coliform standards.

Several RPA buffers are not maintained in a forested condition.

### **Recommendations for the Tidal Segment**

#### Watershed Education

- Fecal coliform problem and source education -- septics, pets, natural sources
- The importance of natural buffers for wetlands and other aquatic resources.

#### Aquatic Buffers

- Establishment of a program to assist landowners in the creation of buffer zones.
- Preservation of a larger existing natural buffer -- up to 300 ft. on new development to protect important marsh transition zones -- these are important to wildlife and marsh bird species as a refuge during high tide.
- Increased forest buffer on the Paleochannel wetlands on the south side of Mainland farm

#### Better Site Design

- Cluster type development to allow for the preservation of the marsh buffers.

#### Stormwater Management

- Stormwater management with an added focus on fecal coliform removal.



## Powhatan Creek Watershed Management Report

### References

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